THE *ISOPERLA* OF TEXAS.

BY STAN W. SZCZYTKO, *Department of Biology, North Texas State University, Denton, Texas.*

The distribution of Plecoptera within the state of Texas was studied. Three species of *Isoperla* were found east of the Blackland Prairie, and specimens collected by J. A. and H. H. Ross in 1939 from El Paso were examined.

The four species consisted of *I. mohri* Frison 1935, two new species, and the El Paso specimens identified by Frison (1942) with some hesitation as *I. longiseta* Banks 1906, which appears to be a new species.

Collections of *Isoperla* from the adjacent states of Oklahoma and Louisiana were also examined. Six species were determined in all, including *I. clio*, *I. mohri*, *I. namata*, *I. longiseta* and what appears to be two new species.

The lacinia, mandibles, and labium were used for separating the nymphs, and the aedeagus and subgenital plate were used for separating males and females respectively.

NOTONEMOURIDAE—SYSTEMATICS AND DISTRIBUTION.

BY JOACHIM ILLIES, *Limnologische Flußstation des Max-Planck-Instituts für Limnologie, Germany.*

The taxonomy and distribution of the Notonemouridae are discussed with an emphasis on the fauna of the Australian region.

THE FAMILY NEMOURIDAE.

BY RICHARD W. BAUMANN, *Department of Entomology, Smithsonian Institution, Washington, D.C.*

The present taxonomic state of the family is reviewed at the generic level. The 13 recognized genera are characterized and the useful characters described and explained. A preliminary phylogenetic diagram is presented showing the basic relationships of the genera to each other in the famly Nemouridae. The distribution of the family is discussed and noted to be Holarctic and Oriental.

AFRICAN SPECIES OF THE GENUS *NEOPERLA* NEEDHAM (PERLIDAE).

BY PETER ZWICK, *Limnologische Flußstation des Max-Planck-Instituts für Limnologie, Germany.*

African *Neoperla* were supposed to belong to a single very variable species by Hynes (1952) and Illies (1966), who together synonymized

29 nominal species under one name. However, instead of the one and only *Neoperla spio* (Newman), there is a multitude of segregates. It has been shown before (Zwick, 1972, 1973), that these are not variants, but are specifically distinct. External genitalia, shape of penis and denticulation of the inner membranous sac need to be studied for reliable distinction of ♂♂. Shape and pattern of sternite 8, shape and denticulation of the vagina and receptacular base, and particularly the shape and structures of eggs provide specific characters in ♀♀. As genital characters alone are distinctive, it is easy to sort to species each sex separately, but it is not normally possible to associate sexes. This seriously hampers a revision of the African *Neoperla.*

Several species groups are distinguished, some were discussed in detail. It is as yet uncertain whether all morphological segregates are of specific or intraspecific rank. There are more than 10 species, possibly as many as 25 or even more. Most of them are very widely distributed in Africa.

Literature Cited

Hynes, H. B. N. 1952. The Neoperlinae of the Ethiopian region (Plecoptera, Perlidae). Trans. R. Ent. Soc. Lond. 103:85–108.

Illies, J. 1966. Katalog der Rezenten Plecoptera. Das Tierreich, 82: I–XXX, 1–631 (Berlin).

Zwick, P. 1972. Notes on African *Neoperla* (Ins., Plecoptera). 14 Internat. Congr. Entomol. Abstracts: 102.

———. 1973. Entomological explorations in Ghana by Dr. Endrody-Younga, 27. Notes on some species of *Neoperla* (Plecoptera). Fol. Ent. Hung. 26 (Suppl.):381–398 (Budapest).

MATING BEHAVIOR OF *PARAGNETINA FUMOSA, PERLINELLA DRYMO* AND *HYDROPERLA CROSBYI*; WITH SPECIAL EMPHASIS ON EXTERNAL SPERM TRANSFER IN *H. CROSBYI.*

by Kenneth W. Stewart, *North Texas State University, Denton, Texas, USA.*

Virgin adult *Paragnetina fumosa* (Banks), *Perlinella drymo* (Newman) and *Hydroperla crosbyi* (Needham & Claassen) were paired in small plexiglass and glass chambers of various sizes. Super-8 mm cinema photographs and microscopic examination of mating pairs revealed species-specific variations in behavior in all 3 species, and an unreported method of external sperm transfer in *H. crosbyi.* Both males and females of *P. fumosa* and *P. drymo* engaged in drumming prior to mating. Capture involved a mere crawling onto the female by male *P. drymo,* but *P. fumosa* males assumed a distinctive "arched-body" posture during capture and an oblique "head-in-the-air" position during mating. Duration of copulation in both species was ca. 1 hr.